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QUICKLY APPLIED BREATHING MASK AND ASSOCIATED HEAD HARNESS

Filed Dec. 12, 1958

2 Sheets-Sheet 1

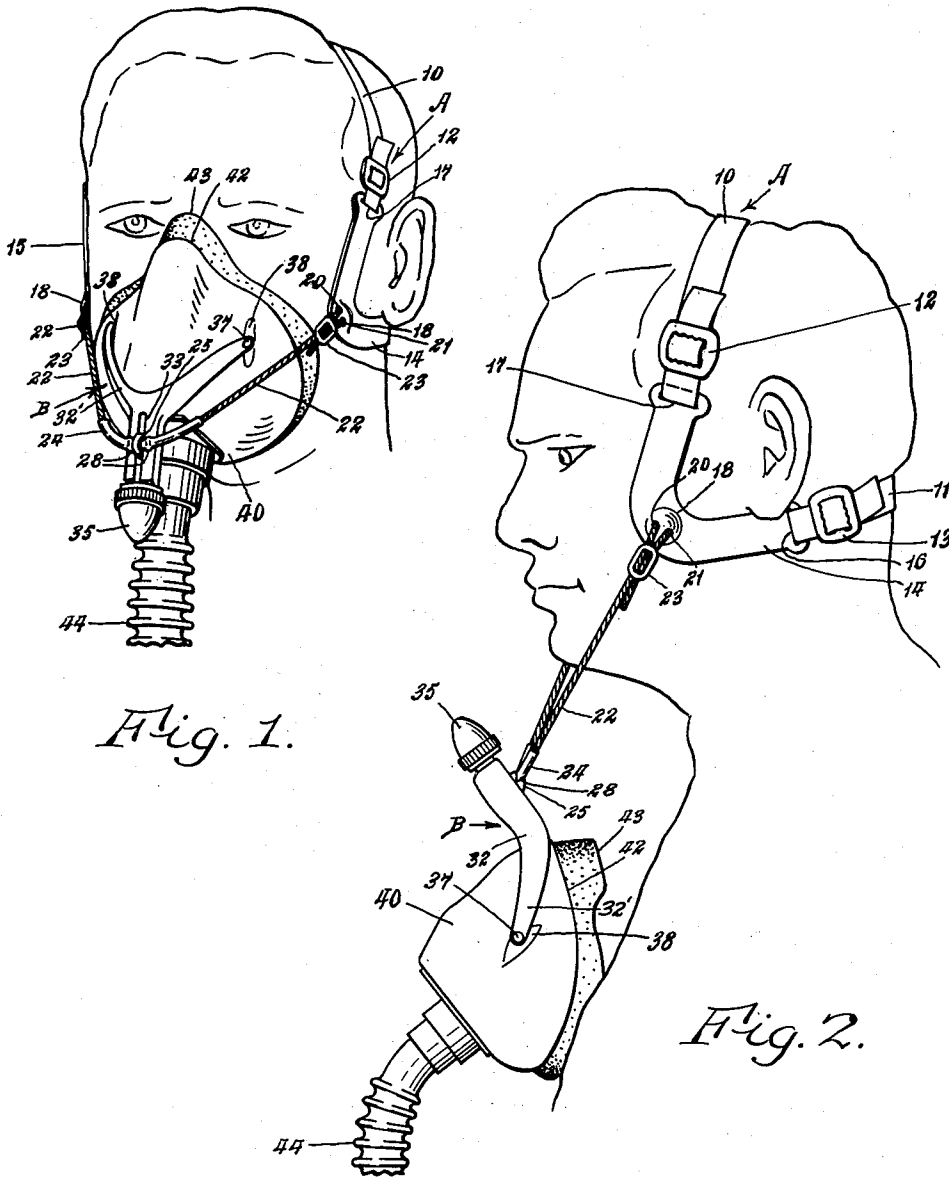


Fig. 1.

Fig. 2.

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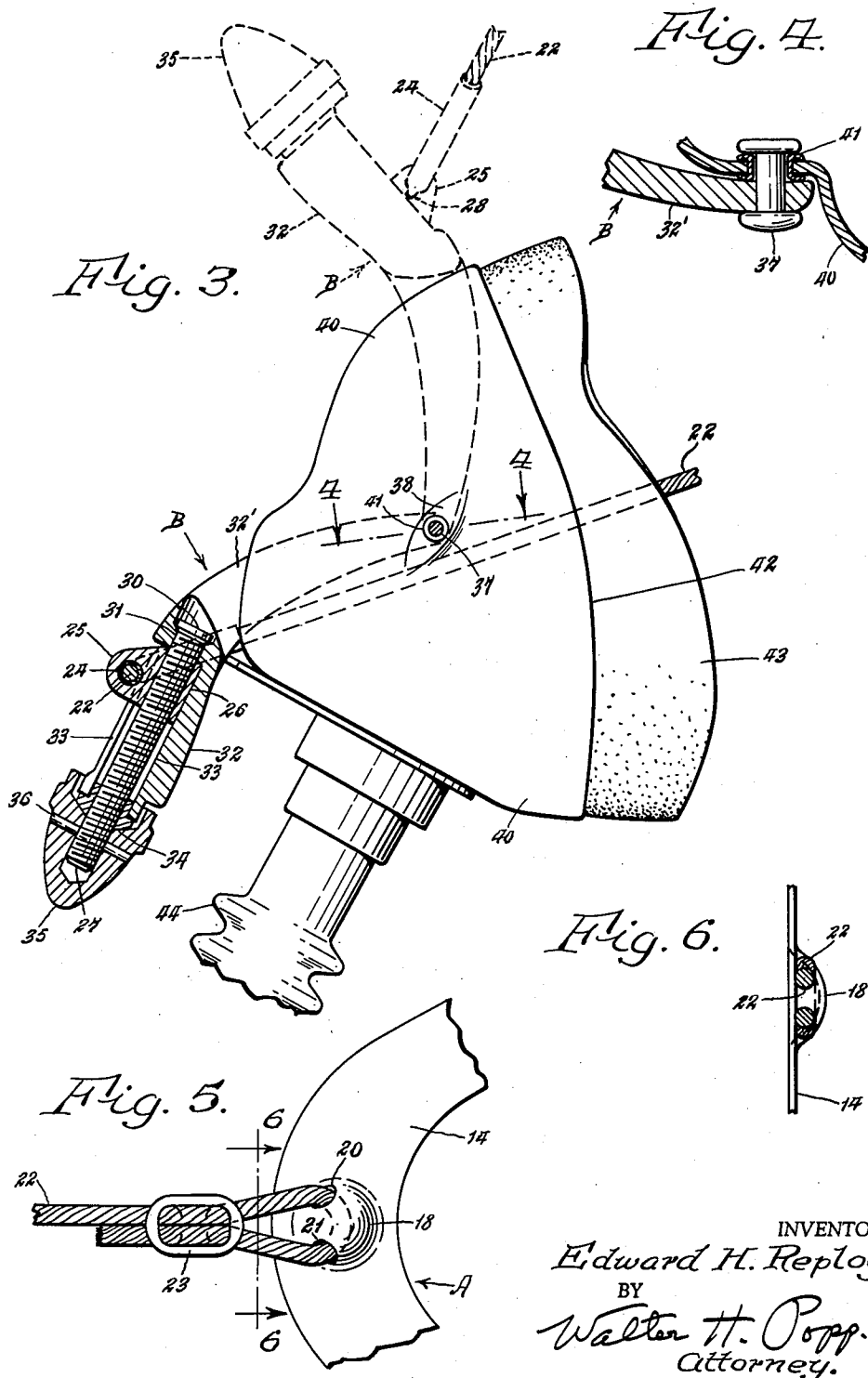
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QUICKLY APPLIED BREATHING MASK AND ASSOCIATED HEAD HARNESS

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8 Claims. (Cl. 128-146)

This invention relates to a combination of breathing mask and head harness which latter is adapted to support said mask from the head of the wearer.

In particular, the invention relates to a breathing mask and head harness combination in which said mask is supported in either an operative or inoperative position from the head harness of the wearer and in which said mask is at all times tubularly coupled to a flexible breathing tube which is adapted to supply breathing fluid to said mask whenever said mask is in its operative position.

The main object of the invention is to enable the individual crew member, who is wearing his individual mask and head harness combination, to normally go about his regular duties unimpeded by said mask which, however, is so conveniently positioned on his chest that it can be instantly clapped firmly and self supportedly against his face, and then operatively used as a breathing mask which is supplied with breathing fluid whenever an emergency occurs, such as when there is a sudden loss of compression in the airplane. Another object of the invention is to provide such a mask and head harness combination that, after the mask has been firmly positioned on the individual's face, he can conveniently clamp said mask still more firmly against his face if he so desires when, for instance, he desires to have a positive pressure in his mask, by which term is meant the existence in said mask of a pressure which is higher than the ambient pressure even when the individual is inhaling.

Other objects of the invention and practical solutions thereof are disclosed in the following description and illustrated in the accompanying drawings, wherein:

FIG. 1 is a diminutive, perspective, front view of the preferred form of the mask and head harness combination which constitutes the present invention, the mask 40 in this view being in its operative position on the face.

FIG. 2 is side elevation of said mask and head harness combination similar to FIG. 1 but showing the mask 40 in its inoperative position positioned idly on the individual's chest.

FIG. 3 is an enlarged side elevation, partly in section, of the mask 40 only, showing said mask in its operative position in full lines, and its toggle lever B and tension cord 22 in their inoperative positions in dotted lines.

FIG. 4 is an enlarged, fragmentary, horizontal section through one side of the mask 40 and toggle lever B, taken on line 4-4, FIG. 3.

FIG. 5 is an enlarged, fragmentary, side elevation of the central part of one of the whiffletrees 15, together with a portion of its companion tension member 22, and showing said whiffletree and tension member in their operative positions as in FIG. 1.

FIG. 6 is an enlarged, fragmentary, vertical section through one of the tension cords 22, taken on line 6-6, FIG. 5.

This invention will be described exactly in its preferred form as shown in the drawings, but it is to be definitely understood that the scope of the invention is to be measured solely by its inherent novelty and the scope of its appended claims.

The head harness A comprises a pair of head straps 10 and 11 provided with adjusting buckles 12 and 13 and a pair of flat, V-shaped, plastic whiffletrees 14 and 15 whose opposite ends are connected to the distal ends of

said head straps 10 and 11 by having the looped ends of said straps passing through suitable slits 16 and 17 that are suitably formed in the opposite ends of said whiffletrees 14 and 15.

Formed by heat pressing at the central part of each whiffletree 14 and 15 is a dimple 18 whose convex surface projects outwardly from the outside surface of its companion whiffletree. A pair of holes 20 and 21 are drilled into the convex surface of each dimple to accommodate one of the looped ends of a flexible tension member or cord 22, the effective length of which is adjusted by an adjusting buckle 23 arranged adjacent each end of said tension cord 22. The latter is preferably constructed of untreated nylon which is slightly elastic but it may be constructed of rubber or other still more elastic material.

The central part of said tension member or cord 22 is received within the bore of a curved, tubular, spreader yoke 24 whose central part is pivotally received within the neck 25 of a slide block 26 the hub of which is threaded onto an adjusting screw 27. The curved spreader yoke 24 is prevented from slipping out of its proper position in the neck 25 by a pair of rectangular crimps 28 which are suitably formed on the outer face of said spreader yoke adjacent opposite sides of said neck 25. These crimps 28 also serve to clamp said tubular spreader yoke 24 firmly onto the tension cord 22 so as to prevent said cord slipping lengthwise in said spreader yoke. The function of this spreader yoke 24 is to spread apart the central part of the tension cord 22 so as to prevent said tension cord from dragging over the sides of the mask 40 and the toggle lever B which are about to be described.

The inner end of the adjusting screw 27 is provided with an annular flange or head 30, and said screw, just outwardly of said head 30, is journaled in a bearing 31 which is formed in the central portion of the main body 32 of a wishbone-shaped, toggle lever B.

The slide block 26 is slidably received within a guideway 33 and its neck 25 projects outwardly from said guideway. Thus, rotation of the adjusting screw 27 adjustably moves the slide block 26 outwardly or inwardly, relatively to the main body 32 of the toggle lever B. Near its outer end, said adjusting screw 27 is journaled in a bushing 34 which is slipped or push fitted into the central part of the main body 32 of the toggle lever B adjacent the outer end of its guideway 33. Thus, both ends of said adjusting screw 27 are journaled in the main body 32 of the toggle lever B and, when rotated, as previously mentioned, adjustably move the slide block 26 inwardly or outwardly in its guideway 33. The distal end of the adjusting screw 27 has screwed onto it an operating knob 35 which, after proper adjustment, is secured to the adjusting screw 27 by a diametral securing pin 36.

Main body 32 of toggle lever B comprises an operating arm portion extending centrally from the bight of a U-shaped portion comprising arms 32'. The two arms 32' of the toggle lever B are pivoted by riveted pins 37 (see FIGS. 4, 3, 1, and 2) upon the small, raised, flat portions 38 of a rather stiff oro-nasal breathing mask 40. A pair of tubular eyelets or grommets 41 are preferably inserted in and squeezed upon the walls of the mask 40 before the pins 37 are riveted, to pivotally connect the arms of the toggle lever B with the mask 40. Said mask 40 is preferably provided on its inner or peripheral edge 42 with a soft, face-engaging, annular cushion 43, which is constructed of sponge rubber or the like, to enable the mask 40 to make fluid tight engagement with different human faces without discomfort. The mask 40 is adapted to receive breathing fluid through the usual corrugated breathing tube 44. The usual exhalation valve (not shown) is located either at the lower end of said breathing tube 44 or, preferably, on the right side of the mask 40 where it does not show in the present drawings.

Operation

When the mask 40 is not in use, it hangs idly on the chest of the individual as shown in FIG. 2. When, however, an emergency occurs and said individual needs oxygen, diluted oxygen or other breathing fluid, he manually grasps the operating knob 35 of the toggle lever B and the adjacent portion of said toggle lever, and swings said toggle lever in a counter clockwise direction, as seen in FIG. 2 preferably keeping the two halves of the tension cord 22 taut. This operation concomitantly causes the mask 40 to be swung outwardly and upwardly into its operative position of FIG. 1. As each mask is ordinarily adjusted for one particular person, there is no need under normal circumstances for any adjustment of the adjusting screw 27 during or after this operation—this adjustment to his individual face having been previously made by suitably turning the operating knob 35 which under these circumstances operates in the capacity of an adjusting knob. However, if the individual desires to have the mask 40 rendered capable of receiving a higher than normal pressure (for instance, a positive pressure) he can turn said operating knob 35 so as to positively prevent any leakage of ambient fluid between the mask 40 and the individual's face, or any leakage of breathing fluid outwardly.

I claim:

1. A mask and head harness combination of the character described comprising: a breathing mask; a toggle lever pivotally mounted on said mask; a head harness; a curved spreader yoke generally centrally and rotatably connected to said toggle lever at a point remote from the pivotal mounting of said toggle lever on said mask; and a tension member connecting each end of said spreader yoke with the adjacent side of the head harness, said yoke holding said tension member laterally outwardly and thereby preventing said tension member from dragging over the sides of said mask and said toggle lever.

2. A mask and head harness combination of the character described comprising: a breathing mask; a toggle lever pivotally mounted on said mask; a head harness; a tubular curved spreader yoke centrally and rotatably connected to said toggle lever; and a tension cord passing through said tubular spreader and connected at its opposite ends to opposite sides of the head harness.

3. A mask and head harness combination of the character described comprising: a breathing mask; a toggle lever pivotally mounted on said mask and constituted of a main body and a slide block which latter is slidably adjustable relatively to said main body; a head harness; and a tension member connected to said slide block at a point remote from the pivotal mounting of said toggle lever on said mask, said tension member being also connected to the head harness.

4. A mask and head harness combination of the character described comprising: a breathing mask; a toggle

lever pivotally mounted on said mask and constituted of a main body, a rotatable adjusting screw and a slide block threaded on said screw; a head harness; and a tension member connected to said slide block at a point remote from the pivotal mounting of said toggle lever on said mask, said tension member being also connected to the head harness.

5. A mask and head harness combination of the character described comprising: a breathing mask; a toggle lever pivotally mounted on said mask; a head harness including a pair of flat whiffletrees each of which has an outwardly protruding dimple at its central part; a tension member having one end passing through the convex surface of said dimple and having its other end connected to said toggle lever at a point remote from the pivotal mounting of said toggle lever on said mask; and head straps connected to the arms of said whiffletrees.

6. A mask and head harness combination of the character described comprising: a breathing mask; a toggle lever pivotally mounted on said mask; a pair of tension members connected to said toggle lever at a point remote from its pivotal connection with the mask; a head harness including a pair of flat, generally V-shaped whiffletrees, the apex portion of each of which is connected to one of said pair of tension members; and head straps connecting the arms of said whiffletrees.

7. A mask and head harness combination of the character described comprising a breathing mask, a toggle lever comprising a U-shaped portion and an operating arm portion, said operating arm portion extending centrally from the bight portion of said U-shaped portion in the opposite direction from the legs thereof, the ends of the legs of said U-shaped portion being pivoted to said mask at opposite sides thereof, a head harness, and a tension member connected to the central operating arm portion of said toggle lever outwardly of said bight portion, said tension member being connected to said head harness, and said central operating arm portion providing manual operating means for said toggle lever automatically applying equally distributed pivotal forces to the legs of said U-shaped portion.

8. A mask and head harness combination of the character described comprising, a breathing mask, a toggle lever pivotally mounted on said mask, a head harness including a pair of substantially flat generally V-shaped whiffletrees each having a pair of arms, and tension means connected to said toggle lever at a point remote from the pivotal mounting of said toggle lever on said mask, said tension means also being connected to said whiffletrees generally centrally thereof.

References Cited in the file of this patent

UNITED STATES PATENTS

2,814,293 Gabb ----- Nov. 26, 1957

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,117,574

January 14, 1964

Edward H. Replogle

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 4, after line 51, insert the following claim:

9. A mask and head harness combination of the character described comprising: a breathing mask connected to a breathing fluid supply tube; a main toggle lever body of wish bone shape, the central, head portion of said body having a longitudinal guideway and a pair of longitudinally arranged bearings; an adjusting screw journaled in said bearings and having an external operating knob; a slide block threaded on said screw and having a neck which protrudes from said guideway; a curved, tubular spreader yoke which is centrally pivoted on the neck of said slide block; a head harness; and a tension cord passing through said tubular spreader yoke and connected at its opposite ends to opposite sides of said head harness.

in the heading to the printed specification, line 8, for "8 Claims." read -- 9 Claims. --.

Signed and sealed this 1st day of September 1964.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

EDWARD J. BRENNER
Commissioner of Patents